respectively in each sub-pixel (as illustrated in FIG. **2**) or formed as an entire layer on the substrate (as illustrated in FIG. **3**).

In the OLED array substrate provided in the embodiment of the present invention, the OLED emits white light first, and then the white light is changed into full color display by the color filter layers. Therefore, the OLED array substrate provided in the embodiment of the present invention is a bottom emitting device.

Embodiment 3

The embodiment of the present invention is substantially same as embodiment 2 with the difference in that, as illustrated in FIGS. **4** and **5**, the black matrix **6** and the color filter layer **7** in the present embodiment are disposed in the same layer, and the via **60** penetrates the first protection layer **31**, the black matrix **6** and the second protection layer **32**.

In the OLED array substrate provided in the embodiment of the present invention, a black matrix **6** is disposed over the TFT **2**, and a first electrode **41** of the OLED is connected with the TFT **2** through a via **60** which penetrates three layers, i.e., the first protection layer **31**, the black matrix **6** and the second protection layer **32**. When the OLED is driven by the TFT to display images, the black matrix **6** can prevent the light emitted by the OLED from incident on the TFT **2**. Therefore, the current deviation would not occur in the OLED driven by the TFT **2**, and the display effect of the active matrix type OLED display device can be ensured.

Furthermore, in the embodiment of the present invention, the black matrix **6** disposed over the TFT **2** is also located between two adjacent sub-pixels, therefore, the black matrix **6** can further prevent light emitted by OLED in the sub-pixel from incident on the color filter layer of adjacent other sub-pixels, which ensures color filter layers in each sub-pixel to align with the display area in OLED and thereby improving the definition of images displayed by the OLED display device.

The method of manufacturing the OLED array substrate provided in an embodiment of the present invention comprises:

S**31**: a pattern comprising a plurality of TFTs is formed on a base substrate.

S**32**: after the completion of the previous step, a pattern of the second protection layer is formed.

The steps S**31** and S**32** are same as the steps S**21** and S**22** in embodiment 2, and will not be described in detail here.

S**33**: after the completion of the previous step, a pattern comprising the color filter layer and the black matrix which are disposed in the same layer are formed, the black matrix is disposed over each TFT.

For example, color filter layers of red, green and blue colors are formed on the substrate using color resin materials by patterning process, and then the black matrix is formed over the TFT and also between the color filter layers.

S**34**: after the completion of the previous step, a pattern comprising a first protection layer is formed on the substrate.

For example, the first protection layer is formed on the substrate by using silicon nitride, silicon oxide or organic resin, and then the vias penetrating the first protection layer, the black matrix and the second protection layer are formed by pattering process.

S**35**: after the completion of the previous step, a pattern comprising a first electrode, a barrier, a luminescent layer, a second electrode and a packaging layer are formed over the black matrix, where the first electrode is connected with the TFT through the via and two adjacent first electrodes are separated from each other by the barrier.

This step is same as the step S**25** in embodiment 2, wherein the luminescent layers **43** may be formed respectively in each sub-pixel (as illustrated in FIG. **4**) or formed as an entire layer on the substrate (as illustrated in FIG. **5**).

In the OLED array substrate provided in the embodiment of the present invention, the OLED emits white light first, and then the white light is changed into full color display by the color filter layers. Therefore the OLED array substrate provided in the embodiment of the present invention is a bottom emitting device.

Embodiment 4

An embodiment of the present invention provides a display device comprising any of the OLED array substrate in the above-mentioned embodiments 1 to 3. The display device may be for example any product or component with display function such as an OLED panel, a TV set, a display, a digital picture frame, a cell phone, a tablet computer.

Since the display device provided in the embodiment of the present invention has the same construction as that of the above-mentioned OLED array substrate provided in embodiments of the present invention, it can result in the same technological effect and solve the same technical problems.

What are described above is related to the illustrative embodiments of the disclosure only and not limitative to the scope of the disclosure; the scopes of the disclosure are defined by the accompanying claims.

The present application claims priority from Chinese Application Serial Number 201310406560.2 filed on Sep. 9, 2013, the disclosure of which is hereby incorporated by reference herein in its entirety.

The invention claimed is:

1. An OLED array substrate, comprising: a plurality of thin film transistors disposed on a base substrate, a black matrix disposed over each of thin film transistors, the black matrix being provided with a via;

a first electrode, a luminescent layer, and a second electrode disposed over the black matrix from bottom to top;

a first protection layer, disposed between the first electrode and the thin film transistor; and

a color filter layer, disposed between the first protection layer and the thin film transistor,

wherein the first electrode is connected with the thin film transistor through the via, the first electrodes disposed over adjacent thin film transistors are separated from each other by a barrier, the black matrix and the first protection layer are disposed in a same layer, the black matrix overlaps the color filter layer partially, and the via penetrates a portion where the black matrix overlaps the color filter layer partially.

2. The OLED array substrate of claim **1**, wherein the luminescent layer is color luminescent layer.

3. The OLED array substrate of claim **1**, wherein the luminescent layer is white luminescent layer.

4. The OLED array substrate of claim **3**, wherein a second protection layer is further disposed between the color filter layer and the thin film transistor; and the via further penetrates the second protection layer.

5. The OLED array substrate of claim **1**, wherein the first electrode is anode, and the second electrode is cathode; or the first electrode is cathode, and the second electrode is anode.

6. The OLED array substrate of claim **1**, wherein the luminescent layers disposed over adjacent thin film transistors are separated from each other by the barrier.